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PROCEEDINGS OF THE
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THE LOCUSTOPSIDAE AND THE PHYLOGENY OF THE ACRIDODEA (ORTHOPTERA)

By Frederick E. ZEUNER, Ph.D., F.Z.S.
British Museum (Natural History).

Important characters of the LOCUSTOPSIDAE and their phylogenetic value.

The close affinities of the Jurassic LOCUSTOPSIDAE with the modern ACRIDIDAE were recognised at an early date (Handlirsch, 1908) and have been re-emphasised by several authors. Regarding the origin of the LOCUSTOPSIDAE, nearly everybody has up to the present followed Handlirsch, who considered them as closely allied to the ELCANIDAE. The latter are provided with long antennae and a long ovipositor and resemble in these and other respects the TETTIGONIIDAE, except in the absence of a stridulatory organ in the cubito-anal region of the elytra. Handlirsch was convinced that the LOCUSTOPSIDAE belonged to the stock of the Ensifera and that the Acridodea are a side-branch of the Ensifera originating in the LOCUSTOPSIDAE.

Although Handlirsch (1908 : 1234) wrote that both the LOCUSTOPSIDAE and the ELCANIDAE had tettigoniid (filiform) antennae and tettigoniid (long) ovipositors,[1] I have been unable to find evidence substantiating his claim. None of the specimens of LOCUSTOPSIDAE that I have seen has long appendages, but I have studied a fair number of ELCANIDAE which exhibit those characters very clearly. It is probable, therefore, that Handlirsch, misled by the resemblance in the venation and pattern of the elytra and by the occurrence in the same deposits of both families, unconsciously transferred the characters of one family to the other. He might also have been influenced by the fact that the most conspicuous genus of the LOCUSTOPSIDAE, *Conocephalella* (fig. 13), was originally described as *Conocephalus*, a genus of the TETTIGONIIDAE.

While preparing the monograph of the fossil Orthoptera Ensifera (Zeuner, 1939), I studied the LOCUSTOPSIDAE and ELCANIDAE of several large collections, especially of the British Museum (Natural History), and the palaeontological museums of the universities of Munich, Berlin and Rostock. It then became apparent that neither family belonged to the Ensifera. In the meantime, the LOCUSTOPSIDAE of the British Museum (Natural History) have been studied again, in connection with the preparation of a monograph of the fossil Acridodea.

[1] In 1930, Handlirsch (: 706) clearly repeated this view [translated]: ". . . the Locustopsids, which had typical tettigoniid antennae and tettigoniid wings, slender jumping-legs and a long ovipositor . . .", and referred to a reconstruction of *Conocephalella capito* Deichmuller with long antennae, though the specimen itself shows short stumps only (see p. 2).

Fortunately, all known specimens of LOCUSTOPSIDAE with bodies preserved are in this collection, and they have afforded a chance to settle the following points.

Antennae have not yet been found in the LOCUSTOPSIDAE, except possibly in *Conocephalella capito* (Deichm.) from the Upper Jurassic of Solnhofen. The unique specimen (fig. 13) shows a straight ridge originating from the head. This was regarded as the antenna by Deichmüller (1886). It is only 5 mm. long, compared with a total length of the specimen of 55 mm. Since long antennae are often excellently preserved on Solnhofen slabs (figs. 14, 15), there is no reason to assume that the antennae of *Conocephalella* were very long and thin. If the short and comparatively broad ridge in question *is* the antenna, it can only have been of the acridoid type, *i.e.* short and thick.

No female specimen is known. It is impossible, therefore, to make any statement about the female gonapophyses, and the length of the ovipositor in particular.

The end of the abdomen of a male of *Locustopsis bucklandi* (Brodie), however, is provided with a conical subgenital plate just as in the modern ACRIDIDAE and related families (fig. 3).

The thorax is box-shaped, as in the modern ACRIDIDAE.

The hind femur is provided with marginal and submarginal ridges (fig. 13), as in the modern ACRIDIDAE. These features, which are described below in greater detail, corroborate the view that the LOCUSTOPSIDAE are most closely related to the ACRIDIDAE.

Relationship between LOCUSTOPSIDAE and ELCANIDAE.

One has to admit that the elytra of the LOCUSTOPSIDAE are reminiscent of those of the ELCANIDAE in several respects, such as the shape (apical portion wider than basal, figs. 1–9, and 12), the pattern of irregular spots on a semi-hyaline membrane, and, at a first glance, the general arrangement of the veins.

There are, however, important differences, mostly due to the fusions of veins in the ELCANIDAE.

In the LOCUSTOPSIDAE, Rs and M are free from one another, though the first branch of M sometimes approaches Rs very closely. In the ELCANIDAE, a fusion has taken place, the root of Rs has become a cross-vein, and all the branches of M + Rs form one long brush of pectinate veins directed towards the distal hind margin (fig. 12).

In the LOCUSTOPSIDAE, CuA has a long, undivided basal portion and two or three terminal branches the most proximal of which runs towards the tip of CuP (figs. 1, 6, 8). In the ELCANIDAE, the undivided portion of CuA is short, its branches (usually three) are very long and parallel to one another as well as to the neighbouring veins, and the most distal branch rises steeply at the base, very often to join M for a short distance (fig. 12).

In the LOCUSTOPSIDAE, Sc extends almost to the apex, and C to about one-third of the length of the elytron. In the ELCANIDAE, Sc is shortened, not reaching beyond half the total length of the elytron, and C is correspondingly shorter.

These differences show that, as regards venation, the ELCANIDAE are in every respect much more highly specialised than the LOCUSTOPSIDAE and that, if the venation only were relied upon, it would be easy to derive the ELCANIDAE from the LOCUSTOPSIDAE.

Moreover, the ELCANIDAE are known for the broadened spines of their hind tibiae (fig. 14), an adaptation to moving on the surface of water. It has therefore been regarded as an established fact that the ELCANIDAE are a specialised side-branch of the LOCUSTOPSIDAE. I have myself supported this view as lately as 1937.

This view was based on the assumption that the LOCUSTOPSIDAE agreed with the ELCANIDAE in all other respects. The body of the ELCANIDAE, however, is ensiferoid, and provided with long cerci, ovipositor and antennae. The one important character in which ELCANIDAE and LOCUSTOPSIDAE agree is the hind femur, which is acridid in both, with sharp marginal and submarginal ridges (figs. 13–15).

It is evidently impossible to derive the one family from the other, the LOCUSTOPSIDAE being highly specialised in characters of the body, the ELCANIDAE in characters of the venation. In view of the profound differences in the structure of the body, the question may be raised whether the ELCANIDAE should be removed altogether from the acridoid stock and included in the Ensifera. There are four serious objections against such procedure: (1) *Elcana* has carinate hind femora of the acridid type, (2) the elcanid venation is more closely related to that of the LOCUSTOPSIDAE than to any other, (3) the males of *Elcana* had no stridulatory organ on the elytra, and (4) it is difficult if not impossible to consider the venation of the ELCANIDAE as of the ensiferoid type.[2]

For these reasons I am still inclined to consider the ELCANIDAE as members of the acridoid stock. In their appendages, they are more primitive, in their venation, more specialised, than the LOCUSTOPSIDAE. The latter have preserved the primitive type of venation of the early Saltatoria.

One may say, therefore, that while the ELCANIDAE represent an early side-branch of the acridoid stock, the LOCUSTOPSIDAE preserved the normal venation but modified the genital apparatus and acquired other typically acridoid characters after the ELCANIDAE had branched off.

Both families flourished in the Liassic. Both have been reported from the Triassic also (fragments of wings), and the ELCANIDAE even from the Permian, so that the separation of the families would have taken place during the late Palaeozoic, and the evolution of their characters during the Triassic at the latest, and possibly in the Permian.

The LOCUSTOPSIDAE ancestral to the higher Acridodea.

The LOCUSTOPSIDAE have many essential characters in common with the modern higher Acridodea (chiefly the families ACRIDIDAE and EUMASTACIDAE). The question might be asked, therefore, whether they are identical with one of the Recent families and, if not, how they can be delimited from them.

In general habitus, the most striking feature of the LOCUSTOPSIDAE is the extraordinary length of the wings compared with the size of the body. Several species had bodies under 10·0 mm., whilst the elytra were almost twice the length of the body. They thus appear to have been excellent fliers.

The elytra of the species of LOCUSTOPSIDAE often closely resemble those of ACRIDIDAE. As a rule, the shape helps to distinguish them, locustopsid elytra

[2] Karny (1930) regarded both the LOCUSTOPSIDAE and ELCANIDAE as subfamilies of the GRYLLACRIDIDAE, in spite of the fundamental differences in all parts of the elytral venation. In the GRYLLACRIDIDAE, the veins are arranged more or less radially, radiating from the base of the elytron, and it is difficult to find among the Saltatoria types of venation more different than those of GRYLLACRIDIDAE on the one hand and LOCUSTOPSIDAE or ELCANIDAE on the other.

being narrow at the base or in the middle and widened in the apical portion (figs. 4, 6), whilst acridid elytra tend to be of equal width throughout or widest in the basal third (fig. 10). The elytra of certain EUMASTACIDAE (fig. 11), however, resemble the LOCUSTOPSIDAE in shape, though differing in venational characters.

The best diagnostic character is provided by C and Sc. These veins are pectinate in the LOCUSTOPSIDAE, and C is comparatively short. In the ACRIDIDAE and EUMASTACIDAE, both veins are very straight (figs. 10, 11), mostly long, and never typically pectinate. In addition, there are a good many minor modifications in the higher Acridodea, but they are confined to certain families or subfamilies and therefore do not provide a general distinction from the LOCUSTOPSIDAE. It is possible that further diagnostic characters will be discovered as our knowledge of the LOCUSTOPSIDAE improves. For the present only the mentioned characters of C and Sc supply a reliable diagnosis.

The higher Acridodea comprise three families with fully developed elytra, the PNEUMORIDAE, EUMASTACIDAE and ACRIDIDAE. None of these can claim to be more closely related to the LOCUSTOPSIDAE than any other.

The PNEUMORIDAE, highly specialised in the possession of an abdominal stridulatory apparatus, have broad, primitive-looking elytra, in shape quite unlike those of the LOCUSTOPSIDAE. C, however, is short, not longer than half the fore margin. In this respect, the PNEUMORIDAE agree with the LOCUSTOPSIDAE, but one hesitates to regard this character as necessarily primitive. M, on the other hand, is a specialised vein. It often lends one or two branches to R (not to Rs !), a feature unknown in other Acridodea. The network of cross-veins, again, looks decidedly primitive. Two further, possibly primitive, characters are the very small anal fan of the hind-wing, and the crested pronotum which, though enlarged, reminds one of the apparently crested pronotum of the LOCUSTOPSIDAE (see p. 6).

The EUMASTACIDAE also exhibit a combination of primitive and specialised features. The character which reminds one most strongly of the LOCUSTOPSIDAE is that the apical portion of the elytron is nearly always wider than the basal (fig. 11). Furthermore, C is frequently rather short. On the other hand, there is a tendency to reduce the number of branches of the veins, and M is sometimes basally fused with R. These specialisations are connected with a tendency of the elytron to become narrow, and this may, or may not, be a continuation of the same trend observed in the LOCUSTOPSIDAE.

The ACRIDIDAE (fig. 10) are distinguished from the LOCUSTOPSIDAE by an increase in the density of the venation. C is long; Sc, R and Rs are very close and almost parallel to each other, and M is very close to R in the basal portion. Curiously, the number of branches of the longitudinal veins is not increased beyond the maximum observed in the LOCUSTOPSIDAE, but secondary veins are intercalated, especially between the branches of Rs and M. The cross-veins are sometimes very dense.

In short, the three modern families of Acridodea with fully developed elytra show divergent venational specialisation, but all three can be derived from the LOCUSTOPSIDAE. Since characters of the body and legs also support this conclusion, one is justified in regarding the Jurassic LOCUSTOPSIDAE as the ancestors of the three modern families mentioned. As a fourth related family, the TETRIGIDAE have to be added, but their elytra are so much reduced that only their many other acridid characters can be relied upon. The probable phylogeny of the modern families will be discussed in my monograph of the Fossil Orthoptera Acridodea.

Preliminary Revision of the Family Locustopsidae Handlirsch.

1906. Locustopsidae Handlirsch, *Fossile Insekten* : 421.

Diagnosis. Acridodea with body and legs of the acridid type. Elytra very long, with acridid venation, but C short, and both C and Sc pectinate.

Distribution. Triassic and Jurassic : Europe, Australia, and South America.

Description. Elytron very large compared with the size of the body, at least sometimes, if not always, twice as long as the abdomen. Shape very characteristic, the apical portion being wider than the basal. There is often a constriction about the middle, due to concave fore and hind margins. The apex is, as a rule, almost semicircular.

The *venation of the elytron* recalls the Acrididae. It is, however, more open generally, and R and Rs are wider apart. C is slightly sigmoidal, provided with pectinate branches, and always shorter than half the fore margin. (In the modern Acrididae, C is mostly straight and longer than half the fore margin.) Sc nearly as long as the fore margin and, beyond the end of C, provided with pectinate branches directed towards the fore margin. Both C and Sc are essentially tettigoniid in structure.

R unbranched, as in the modern Acrididae. Rs less close to R than in the Acrididae, the number of its branches usually low, not exceeding 7. Intercalated veins between the branches of Rs rare (frequent in the Acrididae). Base of Rs never fused with M.

M normally with three branches, of which the apical two form a fork. The third occasionally absent. A closed discoidal cell has not been observed, though M_3 sometimes approaches CuA_1 very closely. An intercalated vein (" discoidal vein ") is claimed to be present in one genus (*Parapleurites* Handlirsch), but judging by the figure, it was much more primitive than the discoidal vein of the Oedipodinae among the Acrididae. It shows, however, the same tendency to develop two rows of cells between M and CuA.

Cu is similar in Locustopsidae and Acrididae. It consists of a branched CuA and a straight, unbranched, CuP which separates at the base of the wing and forms the anterior edge of the clavus-fold. CuA is, in its basal portion, straight and more or less diverging from CuP, until it emits the most proximal branch (CuA_3 or CuA_2). This branch runs down towards the tip of CuP, an oblong, triangular, area being formed in this manner. This area is observed in the Acrididae also. If CuA_3 is not developed, its place is taken by CuA_2.

In several well-preserved specimens, an anal vein can be identified, running close to and parallel with, CuP (figs. 1, 6). This is 1A, forming the hind edge of the clavus-fold (as in the Acrididae and Eumastacidae). Two further free veins are present in the anal area, 2A and 3A. They either bear feathery branches, or are interconnected by network or more or less straight cross-veins. 4A is sometimes identifiable quite close to the hind margin. The anal area is comparatively short, being about half as long as the elytron, and often shorter.

Cross-venation an irregular network of cells or, in narrow spaces, of one row of more or less straight and vertical cross-veins. Intercalated veins begin to appear in a few species only. The cells are proportionately larger than in the typical Acrididae, reminding one of certain Eumastacidae and Pneumoridae.

Pattern variable. In some species, elytron almost hyaline with a few dark spots here and there, as, for instance, in *Erianthus* among the modern Eumastacidae. In others, the dark spots are denser and grouped in the apex and

in the anal area. Others appear to have had smoky elytra without definite pattern, but darker in the apex.

Though many elytra are known, and at least two male specimens have been studied, no stridulatory organ has ever been observed in the anal region of the elytron.

Hind-wing. Two hind-wings, *Locustopsis* (*?*) *dubia* Handlirsch from the Lias of Dobbertin, and *L.* (*?*) *latipennis* Martynov, from the Lias of Turkestan, have been described. They were not found in connection with elytra or parts of the body.

Martynov's wing is more complete than that of Handlirsch, from which it is distinguished only by the vertical cross-veins between Sc, R and Rs. The longitudinal venation is essentially acridoid, but the spaces between the stems and branches are much wider than in acridid hind-wings, and the pre-anal portion is relatively much broader. In the venation, there are resemblances as well as differences. Rs has five terminal branches running down to the end of the clavus-fold, and at least one, if not two, which join CuP at the clavus-fold. The base of Rs must have been more basal than in modern ACRIDIDAE, since it is not preserved in either of the fragments. One important difference is found in M. In the ACRIDIDAE, this vein is fused with R at the base and forms a long fork, the posterior prong of which reaches CuP very nearly at the hind margin. In the supposedly locustopsid hind-wings there is no median fork. The conclusion to be drawn is that M is fused completely with Rs and that the most proximal branches of Rs belong, in reality, to M, as is the case in the ELCANIDAE.

There remains, therefore, a strong suspicion that the two hind-wings mentioned belong to the ELCANIDAE, and not to the LOCUSTOPSIDAE. Martynov (1937) argues at some length in favour of their locustopsid nature. He also mentions that 2A is bent towards the fore margin distally, as in the modern ACRIDIDAE.

The question whether these hind-wings are locustopsid or not, has thus to be left open until complete specimens have been found and studied.

Head. Known of *Locustopsis bucklandi* (Brodie) (fig. 3), *L. nana* Handlirsch, and *Conocephalella capito* (Deichmuller). Comparatively small, short, and high, with a rounded vertex and comparatively small eyes. There is a carina laterally in front of the eyes, as in most of the higher Acridodea.

No definite evidence of the structure of the antennae is available. If the indistinct impression, or ridge, in front of the head of *Conocephalella capito* (fig. 13) is the antenna, it would have been short and fairly thick. The view that it was long can be maintained only by assuming that most of it was lost before the specimen became fossilised.

Pronotum. The pronotum is known of the same three species in which the head is preserved. The state of preservation renders it difficult to ascertain its exact shape, but it can hardly be accidental that in all three cases it appears small compared with the size of the body and the elytra. It has a convex outline above (fig. 3), apparently a crest, and a pointed extension of the metazona. The lateral lobes reach fairly far down the sides. Lateral carinae have not been observed.

This type of pronotum is by no means primitive. It reminds one, for instance, of certain OEDIPODINAE among the ACRIDIDAE, or of the PNEUMORIDAE in which, however, this type has been evolved much further.

Meso-metathorax. The meso-metathorax is indistinctly preserved. It appears to have been box-shaped, as in the ACRIDIDAE (*L. bucklandi*, fig. 3),

and higher than the abdomen. In any group belonging to the Ensifera, this would be a most uncommon feature, but it is very characteristic of the higher Acridodea.

Hind leg. The hind leg is known of *Locustopsis bucklandi* (fig. 3) and of *Conocephalella capito* (fig. 13). The femora of both species are similar, and comparatively broad and short. They have upper and lower carinae and the fish-bone area framed by carinae. They share this structure of the hind femur with the ACRIDIDAE, EUMASTACIDAE, TETRIGIDAE and (to a lesser degree) the PNEUMORIDAE.

The hind tibia of *Conocephalella* is provided with a series of strong spines. In *Locustopsis*, spines have not been found preserved, except a single one in *L. bucklandi*. In *Conocephalella*, they are arranged more densely than in most of the higher Acridodea. This is likely to be a primitive feature.

In an earlier publication (1937) I regarded the spines of the hind tibia of *Conocephalella* as broadened and similar to those of the ELCANIDAE. Re-examination has convinced me that, although the spines are strong and twice as long as the tibia is wide, they are normal for an acridoid hind leg, considering the size of the species.

The number of tarsal segments is unknown.

Abdomen. The abdomen is known of *Locustopsis bucklandi* (Brodie) (specimen I. 10450) and of *L. nana* Handlirsch (specimen I. 10445). It is slender and small, even compared with the size of the other parts of the body, and tapers slightly towards the tip. It resembles in detail the abdomen of a small male Acridid, and there is every reason to suppose that both specimens are males. In *L. bucklandi* (fig. 3) the last two sternites are modified, the terminal one forming a cone-shaped subgenital plate as in many modern ACRIDIDAE. This structure is totally different from the male genitalia of any Ensifera, and also from that of the ELCANIDAE (fig. 15). Cerci or styli are not preserved.

Size and shape. The majority of the LOCUSTOPSIDAE were of a very small size, the body measuring as little as 5–6 mm. in some cases. The wings, however, were comparatively very large, measuring as much as 10·0–12·0 mm. in the smallest species. Although acridoid in most characters, the unusual relation of the size of the body to that of the elytra must have given them an appearance rather different from that of the modern ACRIDIDAE. Some EUMASTACIDAE, however, resemble the LOCUSTOPSIDAE to a certain extent. The LOCUSTOPSIDAE must have been excellent fliers.

The largest known species is *Conocephalella capito* (Deichmuller), measuring about 55·5 mm. from the head to the apex of the elytra.

Geographical and stratigraphical distribution.

Twenty-three species are known, constituting five genera. Of these, *Triassolocusta* appears in the Triassic of Australia, and *Locustopsis* possibly in the Rhaetic of South America. *Locustopsis* flourishes in the Liassic, particularly of England and north Germany; it survives into the upper Jurassic. *Brodiana* and *Parapleurites* are closely related to *Locustopsis* and also of Jurassic age. *Conocephalella* has been found in the upper Jurassic of Solnhofen.

Whilst the occurrence of a locustopsid wing in Triassic deposits suggests that they might go back to a fairly early period, possibly the upper Palaeozoic, their climax occurred during the Jurassic. No trace of the LOCUSTOPSIDAE has been found in the Cretaceous or the Tertiary.

Forms erroneously attributed to the Locustopsidae.

Phaneropterites germari (Münster), from the Jurassic of Solnhofen, placed with the Locustopsidae by Handlirsch (1906), is not determinable. In appearance, the figure of the holotype is quite unlike any Locustopsid.

Locustopsites gigantea Théobald (1937), from the Oligocene of Célas (Gard), France, has nothing to do with the Locustopsidae. It is more likely to belong to the gryllacridid or prophalangopsid stock of the Ensifera, MP being strong and distant from the base.

Preliminary revision of the genera and species of the Locustopsidae.

Triassolocusta Tillyard.

1922. *Triassolocusta* Tillyard, *Proc. Linn. Soc. N.S.W.* **47** : 451.

Genotype. *Triassolocusta leptoptera* Tillyard 1922.

Diagnosis. Fore-wing narrow. Sc shorter than half the costal margin. Rs separating somewhat proximally of the middle of the elytron, with 4–6 branches. M with 3 main branches.

Distribution. Upper Triassic :—Australia : Queensland, Ipswich

Triassolocusta leptoptera Tillyard.

1922. *Triassolocusta leptoptera* Tillyard, *Proc. Linn. Soc. N.S.W.* **47** : 451, fig. 74, pl. 51, fig. 28.

Diagnosis. Total length 21·0 mm., greatest width at about one-fifth from apex, 4·0 mm.

Holotype. No. 99, Queensland Geological Survey.

Specimen studied. British Museum (Nat. Hist.), **In. 33568,** Dunstan Colln.

Parts known. Elytron, except anal region.

Distribution. Upper Triassic :—Queensland : Ipswich, Denmark Hill.

Remarks. Tillyard, in his fig. 74, restored the missing anal portion on the lines of *Locustopsis*.

Locustopsis Handlirsch.

1906. *Locustopsis* Handlirsch, *Fossile Insekten* : 421.
1915. *Locustopsis* : Cockerell, *Proc. U.S. nat. Mus.* **49** : 473.
1939. *Locustopsis* Handlirsch : Handlirsch, *Ann. naturhist. Mus. Wien* **49** : 34.

Genotype. *Locustopsis elegans* Handlirsch 1906, selected by Cockerell, 1915.

Diagnosis. Elytra from 10·0 to 30·0 mm. long. Rs with up to 5 branches. M with 3 (occasionally 2) branches. CuA with a fork, and often with an additional branch. Cross-veins an irregular coarse network, except in certain areas where regular, straight cross-veins may occur.

No discoidal vein between M and CuA.

Distribution. Lias : Europe and Asia. ?Rhaetic : South America.

Remarks. There are 19 species, of which 16 were described from elytra, one from a complete specimen (*L. bucklandi*), and two from hind-wings. The latter have, with some reluctance, been retained provisionally in the genus.

To facilitate determination, the species have been arranged according to size, beginning with the largest.

Locustopsis spectabilis sp. n.

Diagnosis. Elytron 27 mm. long. Anal area with regular cross-veins at right angles to the longitudinal veins. Fig. 1.

Distribution. Lower Lias :—ENGLAND : Worcestershire : Strensham (Holotype), and perhaps from Warwickshire, Knowle, Copt Heath.

Holotype. British Museum (Nat. Hist.), **I. 10563**, Brodie Colln.

Specimen tentatively referred to this species. British Museum (Nat. Hist.), **I. 10654**, Brodie Colln.

Parts known. Elytron.

Remarks. Largest known species of *Locustopsis*.

Locustopsis reticulata Handlirsch.

1939. *Locustopsis reticulata* Handlirsch, *Ann. naturhist. Mus. Wien* **49** : 35, pl. 2, fig. 20.

Diagnosis. Elytron at least 20 mm. long. Rs with 4 terminal branches.

Distribution. Upper Lias :—GERMANY : Mecklenburg, Dobbertin.

Holotype. Department of Geology, University of Rostock, Germany.

Parts known. Distal two-thirds of elytron.

Remarks. Handlirsch's figure is upside down.

This species is, perhaps, identical with *L. elegans* Handlirsch.

Locustopsis elegans Handlirsch.

1884. *Gomphocerites bernstorffi* : Geinitz, *Z. deuts. geol. Ges. Berlin* **36** : 572.
1906. *Locustopsis elegans* Handlirsch, *Fossile Insekten* : 421, pl. xl, fig. 1.
1915. *L. elegans* Handlirsch : Cockerell, *Proc. U.S. nat. Mus.* **49** : 473.

Diagnosis. Elytron 19 mm. long. Rs with 5 terminal branches.

Distribution. Upper Lias :—GERMANY : Mecklenburg, Dobbertin (type locality), and ?Lower Lias :—ENGLAND : Worcestershire, Strensham.

Holotype. Department of Geology, University of Rostock, Germany.

Specimen studied. British Museum (Nat. Hist.), **I. 10561**, Brodie Colln.

Parts known. Elytron.

Remarks. This species was selected as the genotype by Cockerell (1915). It is characterised by the comparative shortness of the elytron (less than $4\frac{1}{2}$ times as long as wide), combined with a great slenderness of the basal half.

None of the venational characters given by Handlirsch can be regarded as specifically important; they occur in many other *Locustopsis* as well.

Locustopsis cockerelli Handlirsch.

1915. *Locustopsis bucklandi* (Brodie) : Cockerell, *Proc. U.S. nat. Mus.* **49** : 473.
1939. *Locustopsis cockerelli* Handlirsch, *Ann. naturhist. Mus. Wien* **49** : 34.

Diagnosis. Elytron 18·0 mm. long. Venation as in *L. lacoei*. Rs with 3 branches.

Distribution. Lower Lias :—ENGLAND : Warwickshire, Binton.

Holotype. U.S. National Museum, no. 3461, Lacoe Colln.

Parts known. Elytron.

Locustopsis elongata Handlirsch.

1906. *Locustopsis elongata* Handlirsch, *Fossile Insekten* : 422, pl. xl, fig. 5.

Diagnosis. Elytron 17 mm. long, with slender base. Rs with 5 terminal branches of which the third carries a small secondary fork. CuA apparently with two branches only.

Distribution. Upper Lias :—GERMANY : Mecklenburg, Dobbertin.

Holotype. Department of Geology, University of Rostock, Germany.

Parts known. Elytron.

Locustopsis uvarovi sp. n.

Diagnosis. Elytron about 17·0 mm. long, slender, about 5½ times longer than wide. Rs with 4 terminal branches. CuA with 3 branches. Fig. 2.

Distribution. Lower Lias : ENGLAND. Exact locality not known.

Holotype. British Museum (Nat. Hist.), **I. 11699**, Brodie Colln.

Parts known. Elytron. Anal area not preserved.

Remarks. This species is reminiscent of *L. spectabilis* sp. n. in several respects, but much smaller. It is more slender than *L. elongata* (with which it agrees in length).

Locustopsis ferghanensis Martynov.

1937. *Locustopsis ferghanensis* Martynov, *Trav. Inst. paléont. Acad. Sci. URSS* **7** : 69, 152, fig. 31.

Diagnosis. Elytron about 17·0 mm. long. Rs with 5–6 terminal branches. CuA with 3 branches, the most proximal of which joins CuP and 1A. Their common continuation does *not* reach the hind margin but is bent upwards to join CuA_2.

Distribution. Lower Lias :—TURKESTAN : Shurab.

Holotype. Palaeontological Institute of the Russian Academy of Sciences, no. 53/2, Shurab II, series H.

Parts known. Elytron, base, precostal area, and apex not preserved.

Remarks. A new genus might have to be established for this species when more material is discovered or the type re-studied.

Locustopsis bucklandi (Brodie).

1845. *Gryllus bucklandi* Brodie, *Fossil Insects* : 76, 96, 101, 125, pl. vii, fig. 16.
1856. *Oedipoda bucklandi* : Giebel, *Fauna Vorwelt* **2** (1) : 309.
1906. *?Locustopsis bucklandi* Brodie : Handlirsch, *Fossile Insekten* : 422.
1939. *Locustopsis bucklandi* Brodie : Handlirsch, *Ann. naturhist. Mus. Wien* **49** : 34.

Diagnosis. Elytra 16·0 mm. long and 3 mm. wide, with straight fore margin which becomes strongly convex distally, and with broadly rounded apex, smoky without spots. Fig. 3.

Distribution. Lias :—ENGLAND : Warwickshire : Grafton (type locality), and Lower Lias :—Worcestershire, Strensham.

Holotype. British Museum (Nat. Hist.), **I. 3555**, Brodie Colln.

Further Material. British Museum (Nat. Hist.), **I. 10450,** from Strensham, and **I. 11728,** Lower Lias, exact locality unknown. The last specimen tentatively referred to this species.

Parts known. Complete specimens with folded wings. Venation incompletely known.

Remarks. Repeatedly referred to in the general part, pp. 1–7. Head, pronotum, thorax and abdomen are best preserved in **I. 10450,** whilst the holotype provides details of the elytra and the hind leg.

Locustopsis magnifica Handlirsch.

1920. *Locustopsis magnifica* Handlirsch, *in* Schröder, *Handb. Ent.* **3** : fig. 144 (: 186). (Figure only.)
1930. *Locustopsis magnifica* Handlirsch : Handlirsch, *in* Kükenthal, *Handb. Zool.* **4** : 707, fig. 741.
1930. *Locustopsis magnifica* : Karny, *Arch. zool. ital.* **15**, fig. 30 (: 236). (Figure only.)
1939. *Locustopsis magnifica* Handlirsch : Handlirsch, *Ann. naturhist. Mus. Wien* **49** : 34, pl. 2, fig. 22.

Diagnosis. Elytron 15·0 mm. long, slightly constricted in the middle, and with apex slightly deflected towards the hind margin. Rs with 5 terminal branches, CuA with 2 branches only. Pattern of large, irregular, dark spots, especially in the distal half.

Distribution. Upper Lias :—GERMANY : Mecklenburg, Dobbertin.
Holotype. Department of Geology, University of Rostock, Germany.
Parts known. Elytron.

Locustopsis reducta Handlirsch.

1939. *Locustopsis reducta* Handlirsch, *Ann. naturhist. Mus. Wien* **49** : 35, pl. 2, fig. 23.

Diagnosis. Elytron 14·0–15·0 mm. long, strongly constricted in the basal half. Sc short, R sending 3 pectinate branches to the fore margin in front of Sc. Rs with 4 terminal branches of which the second carries a subsidiary fork. M a simple fork. CuA with 3 terminal branches.

Distribution. Upper Lias :—GERMANY : Mecklenburg, Dobbertin.
Holotype. Department of Geology, University of Rostock, Germany.
Parts known. Elytron. Base, precostal and anal areas not preserved.

Locustopsis gracilis sp. n.

Diagnosis. Elytron about 14·0 mm. long. Fore margin very nearly straight, apex distinctly pointed, basal portion almost as wide as apical. Rs with 3 terminal branches, M with 3, CuA with 2. Fig. 4.

Distribution. Lower Lias :—ENGLAND : Worcestershire, Strensham.
Holotype. British Museum (Nat. Hist.), **I. 10555,** Brodie Colln.
Parts known. Elytron, most of the anal area destroyed.

Locustopsis dobbertinensis Handlirsch.

1906. *Locustopsis dobbertinensis* Handlirsch, *Fossile Insekten* : 421, pl. 40, figs. 2, 3.
1915. *L. dobbertinensis* Handlirsch : Cockerell, *Proc. U.S. nat. Mus.* **49** : 473.

Diagnosis. Elytron about 14·0 mm. long, about 5 times as long as wide, with rounded apex and slightly concave fore margin. Rs with 4 terminal branches.

Distribution. Lower Lias :—ENGLAND : Worcestershire, Strensham. Upper Lias :—GERMANY : Mecklenburg, Dobbertin (type locality).
Holotype. Department of Geology, University of Rostock, Germany. Specimen figured by Handlirsch, 1906, pl. xl, fig. 3 (herewith selected).
Paratype. Same collection, specimen figured by Handlirsch, 1906, pl. xl, fig. 2.
Further Material. British Museum (Nat. Hist.), **I. 10562** and **I. 10564**, Brodie Colln., both from Strensham. The second specimen tentatively referred to this species.
Parts known. Elytron.
Remarks. Doubtful species. Handlirsch's specimens are incomplete. The two British specimens agree, however, with the recognisable features of *L. dobbertinensis*.

Locustopsis bernstorffi (Geinitz).

1880. *Gomphocerites bernstorffi* Geinitz, *Z. deuts. geol. Ges.* **32** : 521, pl. 22, fig. 4.
1906. *Locustopsis bernstorffi* Geinitz : Handlirsch, *Fossile Insekten* : 421, pl. 40, fig. 4.

Diagnosis. Elytron 14·0 mm. long, about $4\frac{1}{2}$ times as long as wide, constricted in the middle. Sc and R parallel. Rs with 5 terminal branches of which the first two are sub-

sidiaries of Rs_3. M with 3 branches, M_{1+2} with a very short stalk. CuA with 3 terminal branches, of which CuA_1 and CuA_2 diverge, CuA_2 and CuA_3 converge, as in most other species.

Distribution. Upper Lias :—GERMANY : Mecklenburg, Dobbertin.
Holotype. Department of Geology, University of Rostock, Germany.
Parts known. Elytron.

Locustopsis constricta sp. n.

Diagnosis. Elytron reminiscent of *L. bernstorffi* in size and shape, but more slender, over 5 times as long as wide. Stalk of M_{1+2} long, and CuA with 3 parallel branches. Fig. 5.

Distribution. Lower Lias :—ENGLAND : Worcestershire, Strensham.
Holotype. British Museum (Nat. Hist.), **I. 10545,** Brodie Colln.
Parts known. Elytron, anal area not preserved.

Locustopsis nana Handlirsch.

1939. *Locustopsis nana* Handlirsch, *Ann. naturhist. Mus. Wien* **49** : 36, pl. ii, fig. 24.

Diagnosis. Elytron 10·0–12·0 mm. long, with straight fore margin. Sc and R parallel. 4 terminal branches of Rs, 3 of M, and 2 or 3 of CuA.

Distribution. Upper Lias :—GERMANY : Mecklenburg, Dobbertin (type locality). ? Lower Lias :—ENGLAND : Worcestershire, Strensham.
Holotype. Department of Geology, University of Rostock, Germany.
Further Material. British Museum (Nat. Hist.), **I. 10553** (elytron) and **I. 10445** (specimen with body), Brodie Colln. Both from Strensham and tentatively referred here.
Parts known. Elytron, anal area not preserved. Body.
Remarks. L. nana is a doubtful species, since the holotype is very poorly preserved. The two British specimens agree with it in the preserved characters.
I. 10445 has its head, pronotum and abdomen preserved and in respect of these it is similar to *L. bucklandi* (**I. 10450**) in every way.

Locustopsis lacoei Cockerell.

1915. *Locustopsis lacoei* Cockerell, *Proc. U.S. nat. Mus.* **49** : 473, pl. lx, fig. 4.
1939. *Locustopsis lacoi* Cockerell : Handlirsch, *Ann. naturhist. Mus. Wien* **49** : 36. (Misspelling.)

Diagnosis. Elytron about 11 mm. long, about 5 times as long as wide, only slightly narrowed in basal portion. Rs with 4, M with 3 terminal branches. CuA probably with three branches, as in the figured specimen, fig. 6.

Distribution. Lower Lias :—ENGLAND : Warwickshire, Binton.
Holotype. U.S. National Museum, no. 3460, Lacoe Colln.
Material. British Museum (Nat. Hist.), **I. 11738,** Brodie Colln. Lower Lias : exact locality unknown.
Parts known. Elytron.

Locustopsis (?) *argentina* (Cockerell).

1921. *Baiera argentinae* Kurtz, *Acta Acad. nac. Ci. Cordoba, Argentina* **7** : pl. 22, fig. 336.
1926. *Elcana* (?) *argentina* Cockerell, *in* Wieland, *Amer. J. Sci.* (5) **68** : 131.
1928. Ortoptero de la familia Elcanidae : Cabrera, *Eos* **4** : 371.

Diagnosis. Figure reproduced here (fig. 7).

Distribution. Rhaetic :—ARGENTINA : Mendoza prov., Cacheuta.

Holotype. Not traced.

Parts known. Apical portion of elytron.

Remarks. There is no description, and no measurements were given by Kurtz, who considered this fossil as the leaf of a gymnosperm. Cockerell interpreted it correctly as the apical portion of an elytron and assigned it to the ELCANIDAE which, indeed, it resembles. If one can rely on Kurtz's figure, however, there appear to be three branches of Rs, whilst the three following branches or veins are curved in such a way that they cannot have been attached to Rs. Thus, there appear to be the three branches of a free M, and this character classifies the fossil with the LOCUSTOPSIDAE. The attachment of the fossil to *Locustopsis* is purely tentative.

Locustopsis (*?*) *dubia* Handlirsch.

1939. *?Locustopsis dubia* Handlirsch, *Ann. naturhist. Mus. Wien* **49** : 36, pl. II, fig. 25.

Diagnosis. Hind-wing, about 12·0–15·0 mm. long, with oblique cross-veins between Sc and R, and almost vertical cross-veins between R and Rs.

Distribution. Upper Lias :—GERMANY : Mecklenburg, Dobbertin.

Holotype. Department of Geology, University of Rostock, Germany.

Parts known. Fragment of hind-wing.

Remarks. Handlirsch " hardly doubts " that this hind-wing belongs to *Locustopsis*. See also p. 6.

Locustopsis (*?*) *latipennis* Martynov.

1937. *Locustopsis* (*?*) *latipennis* Martynov, *Trav. Inst. paléont. Acad. Sci. URSS* **7** : 70, 152, fig. 32.

Diagnosis. Hind-wing about 18·0–19·0 mm. long, with vertical cross-veins between Sc, R, and Rs.

Distribution. Lower Lias :—TURKESTAN : Shurab.

Holotype. Palaeontological Institute of the Russian Academy of Sciences, no. 976/9, Shurab II, series H. (In the Russian text : 70, given as " Shurab I ".)

Parts known. Fragment of hind-wing.

Remarks. Martynov's opinion that this wing belongs to *Locustopsis* " is certainly somewhat hypothetical; it is based on the similarity of the structure of the preserved portion with that in Acridiodea ". See also p. 6.

Brodiana gen. n.

Genotype. *Brodiana cubitalis* sp. n.

Diagnosis. Elytron resembling *Locustopsis*. CuA with 3 terminal branches, modified. Main stem between CuA_3 and CuA_2 strongly convex towards M, CuA_2 strongly concave towards CuA_1. Fig. 8.

Distribution. Lower Lias :—ENGLAND : Worcestershire, Strensham.

Description. The area between CuA and CuP is broad, owing to the curved portion of CuA. The base of the fork of CuA_1 and CuA_2 is so close to M_3 (closer than can be shown in the drawing, fig. 8), that M_3 also seems to spring from the same point. Its true root at M, however, can be identified. The discoidal cell, therefore, is open. It is filled with an irregular network of coarse cross-veins.

Remarks. *Brodiana* is a modification of the ordinary *Locustopsis*-type to which it is closely related. It is not impossible that the modification of Cu has something to do with stridulation. Some species at present retained in *Locustopsis* might eventually have to be transferred to this genus.

Brodiana gen. n. has been named in memory of the Rev. Peter Bellinger Brodie, who collected this and many other valuable specimens about a hundred years ago.

Brodiana cubitalis sp. n.

Diagnosis. Elytron about 16·0 mm. long. Fig. 8.

Distribution. Lower Lias :—England : Worcestershire, Strensham.

Holotype. British Museum (Nat. Hist.), **I. 10672,** Brodie Colln.

Parts known. Underside of right elytron.

Parapleurites Brauer, Redtenbacher & Ganglbauer.

1889. *Parapleurites* Brauer, Redtenbacher & Ganglbauer, *Mém. Acad. Sci. St. Pétersb.* (7) **36** (15) : 13.
1906. *Parapleurites* Brauer, Redtenb. Ganglb. : Handlirsch, *Fossile Insekten* : 519.

Genotype. *Parapleurites gracilis* Brauer, Redtenbacher & Ganglbauer, 1889.

Diagnosis. Locustopsidae with the characters of *Locustopsis* but with a discoidal vein intercalated between M and Cu. Fig. 9.

Distribution. Upper Lias or Middle Jurassic :—Siberia : Ust-Balei.

Remarks. The describer (probably Redtenbacher) recognised the affinities to the Acridodea of this fossil, but he considered it as closely related to the totally dissimilar genus *Parapleurus* Fischer, of the Acrididae Acridinae (fig. 10).

Parapleurites gracilis Brauer, Redtenbacher & Ganglbauer.

1889. *Parapleurites gracilis* Brauer, Redtenbacher & Ganglbauer, *Mém. Acad. Sci. St. Pétersb.* (7) **36** (15) : 13, pl. ii, fig. 17.
1906. *Parapleurites gracilis* Brauer, Redtenb. Ganglb. : Handlirsch, *Fossile Insekten* : 519, pl. xliv, fig. 6.

Diagnosis. Elytron spotted, 14·0 mm. long. Fig. 9.

Distribution. Upper Lias or Middle Jurassic :—Siberia : Ust-Balei on the Angara.

Holotype. Museum of the Academy of Sciences, Leningrad.

Parts known. Elytron, anal portion missing.

Conocephalella Strand.

1906. *Conocephalites* Handlirsch, *Fossile Insekten* : 518. (Preoccupied by *Conocephalites* Barrande 1852, Trilobita.)
1928. *Conocephalella* Strand, *Arch. Naturgesch.* **92** (A) (8) : 46.
1939. *Conocephalopsis* Handlirsch, *Ann. naturhist. Mus. Wien* **49** : 154.

Genotype. *Conocephalus capito* Deichmüller 1886.

Diagnosis. Large Locustopsidae (elytron about 45·0 mm.) with 6 or 7-branched Rs and with strong spines on the hind tibia.

Distribution. Upper Jurassic : Bavaria.

Conocephalella capito (Deichmüller).

1886. *Conocephalus capito* Deichmüller, *Mitt. min.-geol. praehist. Mus. Dresden* **7** : 24, pl. ii, fig. 12.

1906. *Conocephalites capito* Deichmüller: Handlirsch, *Fossile Insekten* : 519, pl. xliv, fig. 4.
1928. *Conocephalella capito* (Deichmüller): Strand, *Arch. Naturgesch.* **92** (A) (8) : 46.
1930. *Conocephalites capito* Deichmüller: Handlirsch, *in* Kükenthal, *Handb. Zool.* **4** : 707 fig. 740.
1930. *Conocephalites capito*: Karny, *Arch. zool. ital.* **15** : fig. 30 (: 236). (Figure only.)
1937. *Conocephalites capito* (Deichmüller): Zeuner, *Proc. R. ent. Soc. Lond.* (B) **6** : 157.
1939. *Conocephalites capito* Deichmüller: Handlirsch, *Ann. naturhist. Mus. Wien* **49** : 154.

Diagnosis. Length from head to apex of elytra, 55·5 mm. Length of elytra, 45·5 mm. Length of hind femur, 21·0 mm. Fig. 13.

Distribution. Upper Jurassic: "Solnhofen," Bavaria.

Holotype. Department of Palaeontology, University of Göttingen, Germany. Counterpart: British Museum (Nat. Hist.), **In. 36201,** Häberlein Colln.

Parts known. Complete specimen.

Description. Head small, short and high, vertical. Vertex rounded. Eye small. Pronotum long, with a backward extension which is slightly raised. Hind margin of lateral pronotal lobe correspondingly long and straight. Meso-metathorax massive. Abdomen apparently small, whole body little over half as long as the distance from the head to the apex of the elytra.

Fore and middle legs small. Hind legs large. Hind femur very broad, with upper and lower lateral ridges marking the "fish-bone" area, as in the ACRIDIDAE. The fish-bone pattern itself is not preserved. Distal half of hind tibia with a series of very strong spines. Proximal half less well preserved.

Antennae apparently short, see p. 2. No abdominal appendages identifiable.

Elytra very long, fore margin almost straight, apex very slightly pointed. M is not fused with Rs. Rs apparently with 6 or 7 branches.

Remarks. The description has been given in some detail, since most of the characters mentioned therein have not been observed before. It is based on the counterpart of the holotype.

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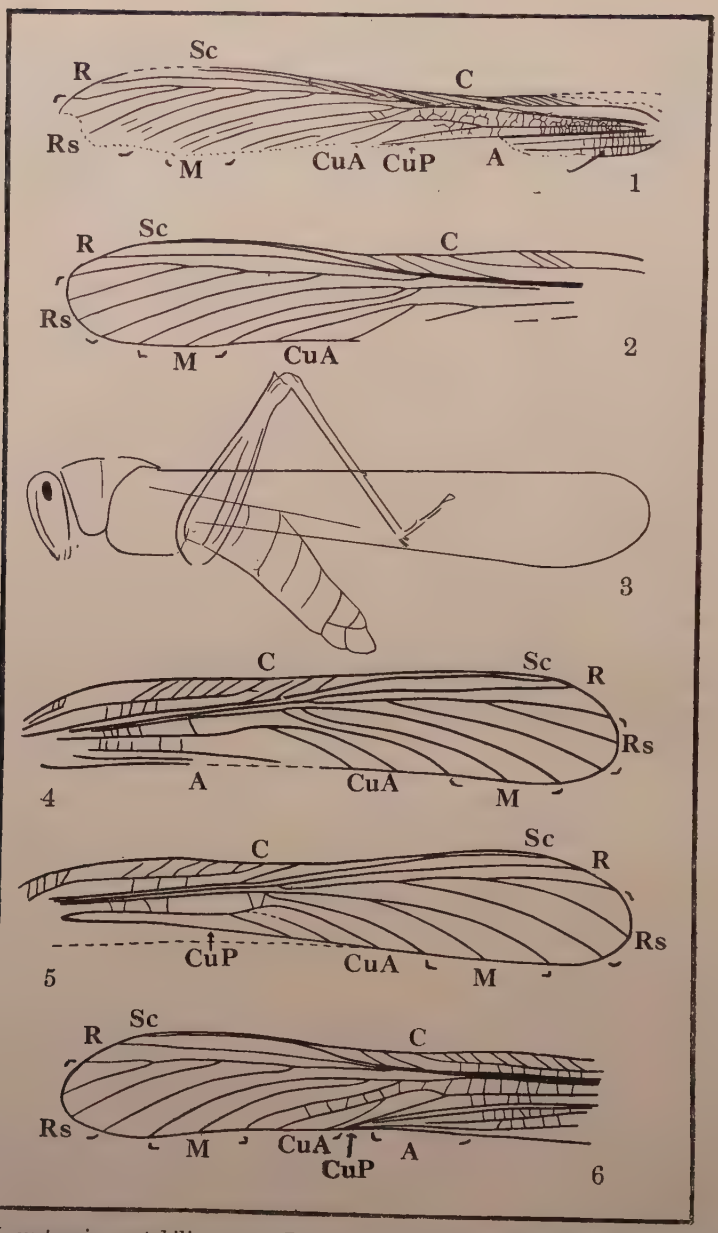

Fig. 1.—*Locustopsis spectabilis* sp. n. Lower Lias: Worcestershire: Strensham. ×2·7. Holotype, B.M.N.H., no. **I. 10563.**

Fig. 2.—*Locustopsis uvarovi* sp. n. Lower Lias: England. × 4·5. Holotype, B.M. N.H., no. **I. 11699.**

Fig. 3.—*Locustopsis bucklandi* (Brodie), ♂. Lias: England. × 4·0. Head, thorax, elytra and abdomen after B.M.N.H., no. **I. 10450,** hind leg after the holotype, B.M. N.H., no. **I. 3555.**

Fig. 4.—*Locustopsis gracilis* sp. n. Lower Lias:—Worcestershire: Strensham. × 5·6. Holotype, B.M.N.H., no. **I. 10555.**

Fig. 5.—*Locustopsis constricta* sp. n. Lower Lias:—Worcestershire: Strensham. × 5·8. Holotype, B.M.N.H., no. **I. 10545.**

Fig. 6.—*Locustopsis lacoei* Cockerell. Lower Lias:—Warwickshire: Binton. × 6·5. B.M.N.H., no. **I. 11738.**

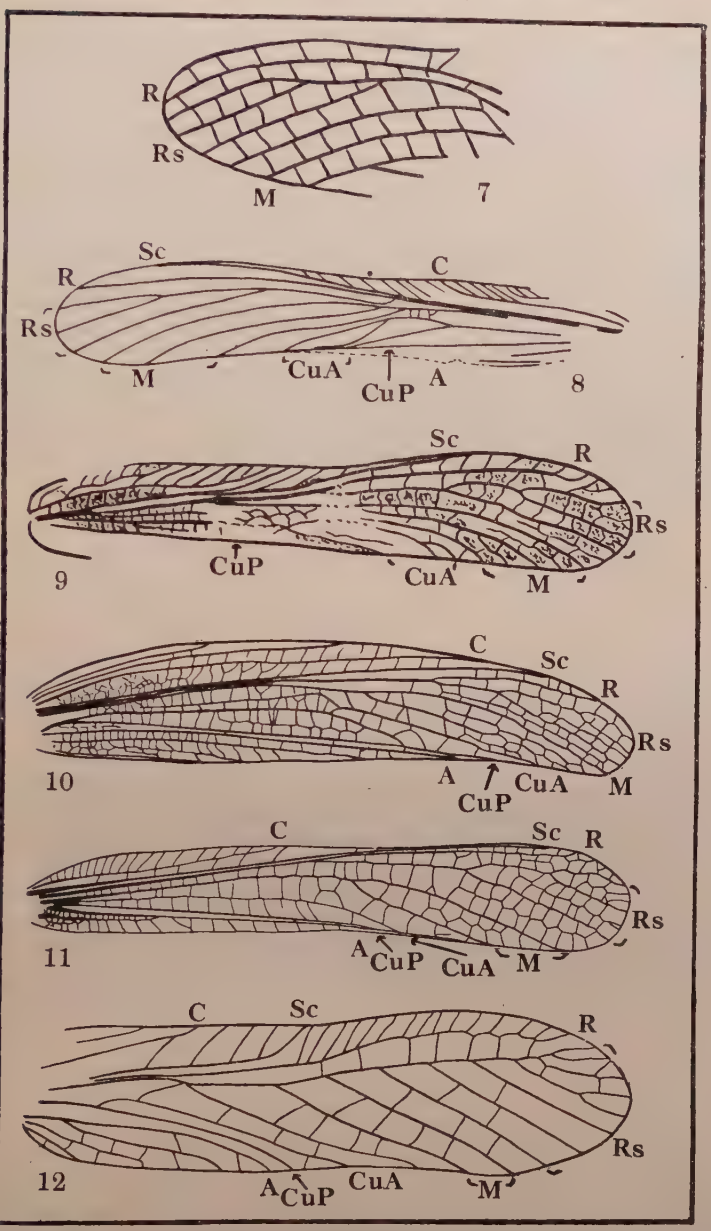

Fig. 7.—*Locustopsis* (?) *argentina* (Cockerell). Rhaetic:—Argentina: Mendoza, Cacheuta. Enlarged. Holotype after Kurtz, 1921, pl. 22, fig. 336.

Fig. 8.—*Brodiana cubitalis* gen. et sp. n. Lower Lias:—Worcestershire: Strensham. × 4·7. Holotype, B.M.N.H., no. **I. 10672.**

Fig. 9.—*Parapleurites gracilis* (Br. Rb. Gb.). Jurassic:—Siberia: Angara, Ust-Balei. × 5·7. Holotype, Museum of the Academy of Sciences, Leningrad. After Brauer, Redtenbacher and Ganglbauer, 1889, pl. 2, fig. 17.

Fig. 10.—*Parapleurus alliaceus* (Germ.), ♂. Recent: Europe. × 5·1.

Fig. 11.—*China mantispoides* (Walk.), ♂. Recent: South China and Further India. × 4·2.

Fig. 12.—*Elcana* sp. indet. Lower Lias: Warwickshire: Binton. × 5·6. B.M.N.H., no. **I. 3376.**

Figs. 13–15.—Photographs of Locustopsidae and Elcanidae from the Upper Jurassic of Solnhofen, Bavaria. A: antenna. C: cerci. F: hind femur with marginal ridges of the fish-bone area. K: hind knee. S: Enlarged spines of the distal part of the hind tibia. T: hind tibia.—Note that many details are distinct only under certain lighting angles. These photographs were taken to show the characters of the hind legs. Head and thorax of fig. 13 have not come out under the lighting angle used, but the antenna is recognisable.

Fig. 13.—*Conocephalella capito* (Deichm.). × 2·1. Counterpart of holotype, B.M.N.H. no. **In. 36201.** Note the apparently short antenna, the ridges of the fish-bone area on the inner side of the left hind femur, and the densely arranged, stout spines of the hind tibia.

Fig. 14.—*Elcana amanda* (Hagen), determined and first figured by Oppenheim, 1888, *Palaeontogr.* **34**: 224, pl. 30 fig. 17. × 1·4. Palaeontological Museum, Munich, no. 258. Note the long antennae, the fusion of Rs and M on the elytron, the marginal ridges of the fish-bone area of the hind femur and the broadened spines, or spurs, on the distal portion of the hind tibia.

Fig. 15.—*Elcana* cf. *amanda* (Hagen), ♂. × 1·5. From Eichstätt near Solnhofen. B.M.N.H., no. **In. 28207.** Note the long antennae, the marginal ridges of the fish-bone area on the hind femur, and the long and unmodified cerci.

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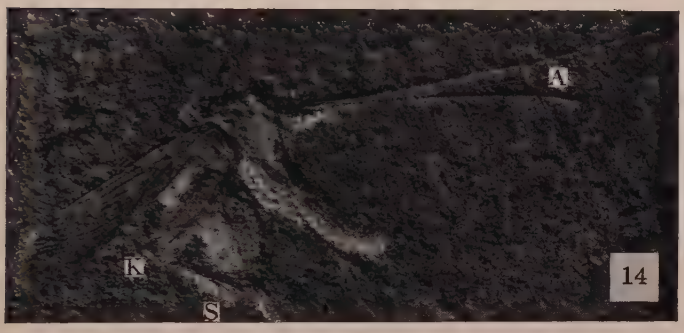

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Photographs of **Locustopsidae** *and* **Elcanidae** *from the Upper Jurassic of Solnhoven.*

Book Notice.

A catalogue of the Plecoptera of the world. By P. W. Claassen. *Mem. Cornell Univ. agric. Exp. Stat.* **232** : 1–235. 1940.

This catalogue of the Plecoptera is the result of many years work by the late Dr. Claassen who unfortunately did not live to see it published.

The arrangement of the catalogue is systematic and an alphabetic index to the genera, subgenera, species and varieties is provided. This index extends to 13 pages of small type in double column and a rough calculation gives a probable inclusion of over 1750 names including synonyms.

The bibliography fills 27 pages and those entries which have not been checked in the original are marked with an asterisk. The number of asterisked entries is high and includes many titles which cause surprise to a European.

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,,	March	4	
,,	April	1	
,,	May	6	
,,	June	3	

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